Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CH203

Course Name: PARTICLE TECHNOLOGY

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks Marks

1	a)	Derive an expression for terminal settling velocity of particle in Stokes' law region.	(7)
	b)	Compare differential and cumulative method of screen analysis	(4)
	c)	Explain effectiveness and capacity of a screen. What are the factors affecting them?	(4)
2	a)	Write about Kynch theory. Outline the procedure of a single batch sedimentation test to design a continuous thickener.	(7)
	b)	Define arithmetic mean diameter and volume surface mean diameter	(4)
	c)	Explain the working of Wilfley table.	(4)
3	a)	Describe any two mineral beneficiation methods commonly used in industries	(8)
	b)	Discuss how will you find the specific surface area and number of particles of a sample mixture using differential method.	(7)

PART B

Answer any two full questions, each carries 15 marks

4	a)	Explain bag filter with diagram and discuss cleaning mechanism	(8)
	b)	A slurry of lime powder giving 40 kg of solid per m^3 of filtrate is to be filtered at constant pressure drop of 5 atm and at a temperature of 300 K. Data from experiments on the sludge and filter flow is to be used to give a value of Rm = 8×10^{10} m^{-1} and the cake resistance of 7×10^{10} m/kg. How many m^2 of filter surface is needed to give 8 m^3 of filtrate in one hour filtration? The viscosity of water at 300 K is 0.0082 poise.	(7)
5	a)	Starting from the fundamentals develop an expression to find filtration time required to recover a given volume of filtrate under constant pressure conditions.	(8)
	b)	Explain the working of cyclone separator with neat sketch. With help of forces acting on cyclone separator obtain an expression for separation factor.	(7)
6	a)	Write about the working of Cottrell precipitator.	(7)
	b)	With neat sketch explain the working of a plate and frame filter press.	(8)

PART C

Answer any two full questions, each carries 20 marks

7	a)	Explain the selection of different size reduction equipment.	(3)

	b)	A certain crusher accepts a feed material having a volume- surface mean diameter of 19 mm and gives a product of volume-surface mean diameter of 5 mm. The power required to crush 15 tonnes per hour is 7.5 kW. What will be the power consumption if the capacity is reduced to 12 tonnes per hour?	(7)
	c)	Explain different types of conveyors for handling bulk solids	(10)
8	a)	With neat sketch describe any two mixers used for mixing of non-cohesive and cohesive solids.	(10)
	b)	Compare open circuit and closed circuit grinding.	(5)
	c)	Differentiate free crushing and choke feeding.	(5)
9	a)	Starting from the basic differential equation derivethe laws of size reduction and state the three laws.	(10)
	b)	Discuss different storage methods of bulk solids.	(10)

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